NATIONAL LIVESTOCK METHANE PROGRAM

PROJECT FACT SHEET

Membrane technology to help measure methane in the rumen

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About the project

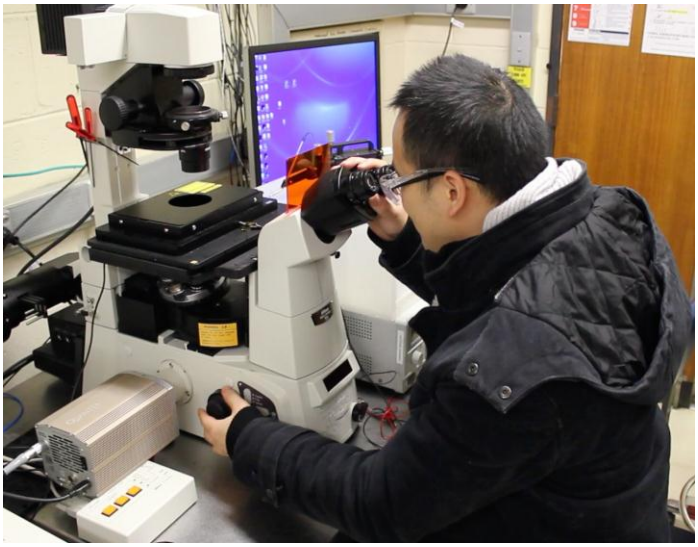
An important step in reducing methane emissions from livestock is to develop an accurate and reliable method to measure the gas. Work is already underway on a new electronic sensor that quantifies greenhouses gases (GHG) produced in the animal's rumen (stomach) This project is focused on developing a critical part of that device – a membrane that allows only specific gases to pass through and be measured, while restricting others that may corrode the sensor's sensitive electronics.

This technology is helping create a robust measurement device that allows researchers and farm managers to assess the effectiveness of different strategies aimed at reducing methane emissions, such as genetic selection or the use of special forages and supplements. The sensor is placed in the stomach of cattle and transmits information on the concentration of methane to a remote recorder.

The sensor has the advantage that it will be able to measure methane emissions from cattle under any production system. The new sensor provides a cost-effective alternative to current measurement methods, which generally only assess a few animals at a time and can be time-consuming and expensive.

What does it mean for producers?

Adoption of this research means producers will have greater confidence in the effectiveness of the methane-reducing practices they may choose to use in their production systems. This will assist producers validate the effectiveness of methane mitigation strategies when entitled to claim carbon credits under the Carbon Farming Initiative (CFI) and the future Emissions Reduction Fund (ERF).



Researcher Dr. Jian Ou examining a membrane under a total internal reflection fluorescence microscope at RMIT.

Location(s):

This research project is being undertaken at laboratories of the School of Electrical and Computer Engineering and the School of Applied Sciences at RMIT University in Melbourne, and CSIRO laboratories in Townsville and St Lucia, Queensland.

BACKGROUND FACTS ABOUT …

The National Livestock Methane Program

The National Livestock Methane Program (NLMP) has been developed to provide producers with practical strategies and tools to help them lower methane emissions while increasing productivity and profitability.

The program consists of 16 research projects grouped into five streams including: measurement of methane, genetics, supplements, forages, and rumen microbiology. These projects commenced in mid-2012 and will run until May 2015.

The NLMP is funded by the Department of Agriculture. It is managed by MLA and receives support from 11 collaborating organisations. For more details on the projects and collaborators, please visit www.mla.com.au

The link between ruminant biology, methane and productivity

When cattle and sheep digest feed, between 2-10 per cent of the feed energy they consume is lost in the form of methane gas. This is caused by the activity of micro-organisms that naturally live in the animals' stomach (rumen) and assist with digestion.

The methane gas (CH_4) is belched out by the animal and into the atmosphere. Simply put, they are 'leaking' feed energy, rather than converting it to muscle. Scientists are working to reduce this loss of feed energy by developing treatments to lower methane emissions. Preliminary research results indicate that some treatments can reduce methane-related energy loss by more than 50 per cent.

Methane is also a potent greenhouse gas and in Australia about 10 per cent of all greenhouse gas emissions and two thirds of agricultural emissions come from methane produced by cattle and sheep. Knowledge and practices aimed at reducing methane emissions from livestock therefore serve the dual purpose of improving feed efficiency, productivity and farm income, while also helping lower Australia's greenhouse gas emissions.